Annual Narrative Report for Calendar Year 1999

Modoc National Wildlife Refuge
Alturas, California

U.S. Department of the Interior
Fish and Wildlife Service
Central Valley / San Francisco Bay Ecoregion

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Review and Approval

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Reviewed and Approved by:

Refuge Manager / Project Leader Modoc NWR	Date
Refuge Supervisor CA/NV Operations Officer	Date
Regional Office Approval	Date

Dedication

This narrative is dedicated to the memory of Ronnie L. Ryno.

Ronnie's family and friends suffered a great loss in 1999. Sadness was also felt by the staff at Modoc National Wildlife Refuge, employees of the Fish and Wildlife Service, the town of Alturas and the birding community. Ronnie was last seen at a birding event in July 1999. Three weeks later, he was found in his vehicle on a deserted gravel road. His death was found to be self-inflicted. It was an extremely difficult time for Ronnie's family, friends and co-workers. He will certainly be missed by all. A Memorial Service for Ronnie was held on September 2, 1999 at Modoc National Wildlife Refuge. The following are thoughts and memories of the service as described by several co-workers:

Nearly 100 friends, relatives, co-workers and neighbors gathered on the Refuge at the Wigeon Pond Overlook for the service. A smoky pall had been hanging over Alturas for the previous two weeks because of the numerous forest fires that had been raging across California, but this morning was crisp and clear. The morning air had a definite bite to it. The marsh was alive with an energy that was palpable and the noisy sound of sandhill cranes, Canada geese, and ducks filled the air. The birds were restless and it was very obvious that the fall migration was in full swing. Many remarked what a gorgeous morning it was. It was a beauty!!

The eulogies were many and touching. There were tears and laughs, songs and fond memories of happier times. We mourned the death, but mostly we celebrated a life of a song, father, brother, neighbor, co-worker and friend who died too young.

The show stopper occurred during a tearful eulogy given by Ronnie's father. In the middle of the eulogy, a flock of Canada geese flew over the assembled crowed in the perfect "V" formation as they often do. They approached from the rear and flew directly overhead and were very focal in their honking, yet their flight was very slow and deliberate. Ronnie's father stopped in mid-sentence, tears falling from his face, and gazed skyward as the geese slowly cruised by. By now everyone was looking at the geese. As soon as they passed overhead (less than 100 yards) a single goose set its wings and peeled off from the formation and sailed down, gently and quietly landing on the mirror smooth pond immediately adjacent to the assembled crowd. The rest of the flock continued flying off to the northwest. You can read into that whatever you'd like. All we can tell you is that it happened just as described. Later in the service, one of the eulogists thanked "those birds" for their final salute to Ronnie.

One thing that was learned from a school teacher who eulogized Ronnie was that he was a regular visitor to the local schools in Alturas where he entertained, enlightened and educated kids of all ages about the wonders of birds. The teacher said there were literally hundreds of kids over the years that had benefitted from Ronnie's "bird on a stick" presentations. All the school kids knew him as "The Bird Man". The Bird Man — yes, it fits!! A simple epitaph yet so fitting. Those three words summarize the Ronnie Ryno that many of us knew.

Good bye Bird Man.

Introduction

Fed by snowmelt from the Warner Mountains, the Pit River creates an oasis for wildlife in the high desert of northeastern California—Modoc National Wildlife Refuge. The Refuge was established in 1961 to manage and protect migratory waterfowl. Funds available under the Migratory Bird Duck Stamp Program helped purchase this Refuge. The 7,021 acre Refuge is located along the south fork of the Pit River in Modoc County, just south of the town of Alturas in extreme Northeastern California. The Refuge is bordered on the east side by the Warner Mountains and on the west side by the Adin Mountains. The Warner Mountain range rises to an impressive average elevation of 8,000 feet and contains extensive stands of ponderosa pine and white fir trees. This mountain range is also the principal watershed for the entire Pit River Valley west of it, which includes the Refuge. The landscape surrounding the Refuge includes rolling hills, canyons, and plateaus with a sagebrush and juniper vegetative community.

Several habitat types are represented on Modoc NWR including freshwater lakes and ponds, irrigated meadows, farm land, natural flood plains, marsh communities, riparian corridors, and sagebrush and juniper uplands. Soil types are mostly heavy clays having a high alkalinity. Black alkali surrounded by salt concentrations are not uncommon on the poorly drained areas of the Refuge.

Modoc NWR is one in a chain of National Wildlife Refuges along the Pacific Flyway extending from Alaska to Mexico. The Refuge is part of a larger complex of mid-altitude wetlands and lakes of Northeastern California and strategically situated as an important resting and feeding area for migratory birds. Permanent ponds, seasonal marshes, and wet meadows beckon thousands of waterfowl, shorebirds, raptors and songbirds to the Refuge as they make their journeys between nesting and wintering grounds along the Pacific Flyway. Modoc County acts as a migrational hub and staging area for ducks, geese and other wetland birds on the southward migration funnel into this region, which is 60 miles east of the Klamath Basin marshes. After feeding and resting on the Refuge, they continue to the Central and Imperial Valleys of California and other wintering areas. This pattern is reversed in the spring. The Refuge's wetlands and adjacent uplands are also an important nesting area for more than 76 species of ducks, geese, greater sandhill cranes and several other species of marsh birds. In total, more than 250 species of birds have been documented on the Refuge. In addition to bird species, the diverse habitats on the Refuge support a wide range of mammals, reptiles, amphibians, insects and plant life.

Modoc is one of over 500 refuges in the National Wildlife Refuge System — a network of lands set aside specifically to conserve fish, wildlife and plants. Managed by the U.S. Fish & Wildlife Service, the System is a living heritage, conserving wildlife and habitat for people today and for generations to come.

Highlights

- A significantly large number of MMS projects (nine!) were funded this year to assist in reducing the maintenance backlog or replacement of equipment that exists at the Refuge

Climatic Conditions

Table X: Summary of Climatic Conditions in Calendar Year 1999 at Modoc NWR

Month	Minimum Temperature in F°	Maximum Temperature in F°	Average Temperature in F°	Total Precipitation (inches)
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				
Total	n/a	n/a	n/a	

Land Acquisition

Planning

PUBLIC PARTICIPATION

Refuge staff continued to attend meetings of the Modoc County Board of Supervisors, the Modoc County Fish, Game and Recreation Commission, and the Modoc County Land Use Committee when various issues associated with the Refuge were to be discussed.

COMPLIANCE WITH ENVIRONMENTAL AND CULTURE RESOURCE MANDATES

The following was undertaken at Modoc NWR in the year 1999 to meet with various environmental or cultural resource mandates:

1. Cultural resource staff from the Regional Office performed necessary surveys and provided cultural clearance for the improvements to the Refuge's main entrance road.

Administration

PERSONNEL

Insert photo of staff

Personnel at Modoc NWR during the calendar year 1999 included (from left to right in photo):

Greg L. Albertson - Engineering Equipment Operator, WG-9, Perm. full-time
Carl Cox - Gardener, WG-4, Seasonal Temp.
Anne Marie LaRosa - Refuge Manager/Project Leader, GS-12, Perm. full-time
Patty L. Walcott - Office Automation/Wildlife Biologist, GS-7 Perm. full-time
Bradley A. Storm - Engineering Equipment Operator, WG-9, Perm. full-time
Ronnie L. Ryno - Assistant Refuge Manager/Deputy Project Leader, GS-11, Perm. full-time, (not pictured)

In 1999, the Refuge had five full-time employees. Jenny Barnett transferred to Sheldon-Hart Mountain NWR in 1998, leaving the Office Automation/Wildlife Biologist position vacant for several months. Patty Walcott, a wildlife biologist, transferred from the Portland Regional Office, Personnel division to fill the position in 1999. With the unfortunate death of the Assistant Refuge Manager, Ronnie Ryno, in August of 1999, his position remained vacant for the remainder of the year. It was decided by the Refuge Manager near the end of the year to have a full-time Administrative Assistant and a full-time Biologist at the Refuge, instead of having two full-time positions of a Assistant Refuge Manager and a Administrative / Wildlife Biologist as in years past. Patty Walcott was to become a full-time Wildlife Biologist once the full-time Administrative position was filled in the year 2000.

Table X: Staffing Levels at Modoc NWR from 1996 to 2000

	PERMANENT	TEMPORARY	TEMPORARY
Year	**Full-Time**	**Maintenance**	**Biol Technicians**
1995	5	1	0
1996	5	1	0
1997	5	2	3
1998	5*	3	3
1999	5*	1	1

*only through a portion of the year

VOLUNTEER PROGRAMS

Crews from the California Department of Forestry Devil's Garden Conservation Camp ("Con Crew") provided invaluable "volunteer" labor for various Refuge projects. The Con Crew consists of inmates that are not directly paid; therefore, their work is considered volunteer time. The Refuge pays only a minimal charge for the supervision of the inmates by CDF employees and the use of necessary equipment for the project. Projects the Con Crew completed in the year 1999 included:

- clean-up of litter and debris at Dorris Reservoir, as well as painting of the vault toilets in preparation of public use of the Reservoir in the spring and summer

- clean-up of the parking lots and painting of the vault toilets at the North and South Hunt Units for the opening of waterfowl hunting season

FUNDING

The following table outlines funding for the Refuge over the past five years.

Table X: Funding Levels at Modoc NWR from Fiscal Year 1996 to 2000

Subactivity	1995	1996	1997	1998	1999
1121	n/a	n/a		$10,500	$21,000
1261				$316,900	$395,376
1262				$58,000	$197,000
4961				$1,788	$1,788
6351	n/a	n/a			
6860					
8555 - TEA 21	n/a	n/a	n/a	n/a	$115,000
8610					
9251					

SAFETY

Safety meetings were held almost every month throughout the year with a variety of topics discussed. While attending a training conference in Stevenson, Washington in February of 1999, the Refuge Manager rolled the Jeep Cherokee during wintery conditions. The Refuge Manager suffered short-term neck and body pain, but no long-term injuries occurred. Repairs to the vehicle totaled approximately $5,200.

Three Refuge employees participated in a Red Cross first aid class that was held at Klamath Basin NWRC.

REFUGE REVENUE SHARING

A Refuge Revenue Sharing check in was issued to Modoc County in 1999.

OTHER PROGRAMS

Federal Highway Administrative TEA-21 Road Program

In fiscal year 1999, the Refuge received $115,000 in TEA-21 funds to complete improvements to the main entrance road and public use road to the Refuge. After permits and clearances were received, Fitch Sand and Gravel was issued a contract to re-contour and place asphalt paving along the 1.25 mile entrance road. As part of these improvements, a small, visitor parking lot was paved at the end of the Auto Tour Route, just off the entrance road. It is planned for the direction of the Auto Tour Route to switch next year, which will enable the new parking lot and a planned information kiosk to be at the new start/entrance of the Auto Tour Route. Currently, the information kiosk resides at the old entrance of the Auto Tour Route, near the Refuge headquarters.

Habitat Management

GENERAL

Although some refuges are undisturbed wilderness areas, most are actively managed to provide food, water, and shelter for wildlife. Each year, managers of National Wildlife Refuges restore and enhance lands and waters to increase their value to wildlife, using various techniques. At Modoc NWR, several habitat management techniques were utilized in the year 1999 and are described throughout the text that follows.

WETLANDS

Wetlands are among the most productive habitats in the world for fish, wildlife and humans. To birds, not all wetlands are created equal. Some prefer deep water for fishing; others prefer warmer, shallow water

with its wealth of aquatic plants and insects; some simple need a mere inch or two of water to probe for invertebrates in recently exposed mud.
In the arid West, water has always been a valuable commodity to all forms of life. Water and wetland habitat are the keys to attracting migratory birds and other wildlife in this high desert area. But as human use of water has grown, the amount remaining for wildlife continues to diminish. At one time, the State of California had over 4 million acres of wetland habitat. Today, less than five percent remains. The practice of draining wetlands and diverting streams to other uses, which began in the late 19th century, has made these precious resources far less common in the arid West. Modoc NWR contained limited wetland habitats when originally acquired. The marshy character of the area had been altered by agricultural drainage, particularly along the South Fork of the Pit River. Wetlands within the Refuge have been restored over time to provide valuable wildlife habitat.

Water is key to attracting waterfowl in this high desert area. Balancing human consumption with wildlife needs requires careful water conservation and management strategies. The staff uses the Refuge's elaborate water control system to fill or drain permanent ponds and seasonal marshes to meet the needs of many wildlife species simultaneously. Water is conveyed through a system consisting of an 11,100 acre foot storage area (Dorris Reservoir), 20 miles of major canals, 50 miles of minor ditches, the South Fork of the Pit River and several pond and marsh units. This system provides water for all the wetland areas on the Refuge and is managed to produce the maximum benefits for wildlife and their habitat, with a minimum amount of labor.

Planned annual operations include maintaining non-fluctuating water levels throughout the system while supplying a continuous flow of fresh water.

CROPLANDS

The farming program at Modoc NWR is conducted entirely by force account and is intended to provide a high energy food source, such as barley and wheat grain, for waterfowl and greater sandhill cranes during migration. Also throughout the year, these planted fields help to avoid waterfowl depredation on adjacent, private farm lands. This year a total of approximately 312 acres of Refuge lands were planted with grain. Approximately 76 acres were planted with spring barley in the Matney fields #1 (8 ac.), #2 (8 ac.), #3 (23 ac.), #6 (22 ac.) and #7 (15 ac.). Approximately 210 acres were planted with winter wheat in the North Grain field (80 ac.), the Grandma field (50 ac.) and the Town Grain field (80 ac.). Additionally, approximately 26 acres were planted with rye in Matney field #9. All grain was planted at a rate of approximately 60 to 65 pounds per acre.

Annual or cyclical irrigation of a few farmed fields continued on the Refuge, including: flooding of the South Grain field to follow the previous year's planting of winter wheat, and sprinkler irrigation of the Sub-headquarters unit to maintain a quality riparian area.

GRASSLANDS

The Refuge has nearly 5000 acres of grasslands. 1514 acres of which are dominated by bunch grasses with an intermix of sweet clover and cheatgrass on the better drained areas of the Refuge. These areas are

managed for waterfowl production and are kept undisturbed with no haying or grazing activities. The remaining 3500 acres are managed as wet meadows that are irrigated, mowed, grazed and/or burned to remove old plants, recycle nutrients and stimulate new plant growth. Irrigation of the Refuge's meadows in the spring and fall is conducted to mimic natural cycles of flooding that once occurred in the Pit River Valley. The main objective of managing these wet meadows is to provide succulent green browse for Canada geese in the spring and fall, as well as nesting and feeding areas for greater sandhill cranes in the spring and summer. To a lesser extent, this habitat also provides nesting areas in the spring and summer for other bird species such as mallards, cinnamon teal and redheads, and provides feeding areas for mule deer, other mammals, raptors and songbirds.

OTHER HABITATS

The majority of the uplands are dominated by sagebrush, greasewood, rabbitbrush, and native and non-native grasses on the dry, poorly drained alkaline areas at Modoc NWR. The uplands on the Refuge at Dorris Reservoir are also dominated by juniper trees. Due to past and current uses of the Refuge uplands and other private uplands in Modoc County, high quality sage-shrub steppe habitat in this high desert area is rare. The Refuge maintains a no use policy in regard to these uplands in order to ensure survival of remnant stands of this native vegetation on the Refuge. It is hoped that native grasses such as Great Basin wild rye and other forbs will return to dominate over non-native species. For wildlife, these areas provide excellent habitat and cover for quail, pheasants, western meadowlarks, sage thrashers, American robins, bluebirds, finches, other songbird species, deer, pronghorn, rabbits, snakes, kangaroo rats and ground squirrels.

Small, but important, riparian areas on the Refuge provide excellent nesting and forage areas for mammals, raptors, woodpeckers and neotropical migrants such as warblers, swallows, flycatchers and sparrows. The riparian area associated with Pine Creek that passes through the Refuge, has been in a non-use status since 1983 when cattle grazing in the area was eliminated. Planted and previously existing willow trees, narrow-leaf cottonwood trees and wild rosebushes continue to thrive and provide excellent for wildlife. Additionally, the riparian area at the Sub-headquarters unit remains in non-use status with planted and previously existing trees thriving.

HAYING

Meadows are important feeding areas for sandhill cranes, geese, nesting waterfowl, and mule deer. Breeding waterfowl and cranes feed on early plant growth and invertebrates that live in the soil. To encourage growth of this nutritious food, the Refuge implements a haying program at the end of the summer as an effective and economic tool to remove old plants and recycle nutrients. After the meadows are hayed, they are irrigated to stimulate new plant growth. Some, but not all meadows are also grazed in late fall / early winter. Then in the following spring, the sun thaws the frozen soil of the meadows earlier, giving new plants a head start.

Private farmers who possess grandfather rights or who have successfully bid on haying a specific meadow are allowed to harvest hay on the Refuge under a Special Use Permit and conditions. As described earlier,

this year the maintenance staff was able to maintain enough water in the wet meadows for a successful spring production of green browse and nesting areas. The following table summarizes the harvest of hay in August of 1999 on the Refuge, as well as the previous year for comparison purposes.

Table X: Summary of Haying Program at Modoc NWR

Field	Permittee	Tons of Hay			Total Revenue		
		1997	1998	1999	1997	1998	1999
Bailey	Earl Nisly		175	141			
Front	Lawrence Ray		912	911			
Hamilton Tract*	Pete Weber		85	94			
Heifer (plus a portion of Sandy Slough)	Fernand Larranaga		285	324			
House	R.A. Stanford		136	109			
Pine Creek	Warren Weber		553	487			
Pine Creek S.	Stephen Nelson		356	260			
Sharkey	Mitchell Brown		330	344			
Town (plus a portion of Sandy Slough)	Robert Schluter		424	338			

*****delete 1997**********

GRAZING

In combination with the haying program, the Refuge implements grazing of cattle on certain wet meadows in the late fall / early winter as another effective and economic tool to remove old plants and recycle nutrients. Private ranchers who possess grandfather rights are allowed to graze a predetermined number of head of cattle (measured in Animal Unit Measurements or AUMs) on the Refuge under a Special Use Permit and conditions.

In order to more closely monitor the number of cattle on the Refuge, this year Refuge staff counted and documented the number of cattle as they were placed on or removed from the Refuge. From 1998 to 1999, the following grazing of cattle, reported in AUMs, occurred at Modoc NWR:

**********delete 1997*********

Table X: Summary of Grazing Program at Modoc NWR

Field	Permittee	AUMs -- Dates			Total Revenue		
		1997	1998	1999	1997	1998	1999
Bailey	Bill Wilson		102 Grazed: 10/8 - 1/11	152 Grazed: 10/18-10/26			
Ebby Pasture NW	John Younger		101 Grazed: 5/16 - 8/30	43 Grazed: 9/4 - 9/8			
Hamilton Tract	Pete Weber		571 Grazed: 4/22 - 12/1	291 Grazed: 9/13 - 12/29			
Hansen West	Robert Schluter		91 Grazed: 9/19 - 11/27	106 Grazed: 10/12 - 12/1			
Pine Creek	Warren Weber		175 Grazed: 10/3 - 11/25	232 Grazed: 9/30 - 11/17			
Pine Creek S.	John Younger		81 Grazed: 9/19 - 11/12	81 Grazed: 9/19 - 11/10			
Town	Robert Schluter		424 Grazed: 10/10-11/21	386 Grazed: 10/12 - 12/1			

FIRE MANAGEMENT

For a fee of $500 for 1999, the Alturas Rural Fire Department provided fire protection for the Refuge structures and lands.

The following ponds or fields at the Refuge were managed with prescribed burns that were performed by the fire crew from Klamath Basin NWRC: Goose Pond, Railroad Pond and Bull field (only a ½ acre in the southern portion).

PEST CONTROL

The Refuge continued to work with the Modoc County Department of Agriculture to manage weeds on the Refuge. In this cooperative program, the Refuge pays for half the costs of chemicals, equipment use and labor to control weeds on the Godfrey Tract. In 1999, the Refuge paid $490.22 to Modoc County for this service.

A temporary employee, Carl Cox, was hired again this year from mid-May to early October to mainly

conduct pest control at Modoc NWR. His main focus was on the continuing battle with Scotch thistle, a Class A noxious weed in the State of California. Herbicides and hand removal were utilized to treat Scotch thistle. A lesser amount of time was also spent battling Canada thistle and bull thistle, mostly by mechanical methods of control (mowing and hand removal) by Refuge staff and the Devil's Garden Conservation Camp crew.

The Refuge's battle against Scotch thistle continues on with this year's efforts only managing to maintain the current status, if not continue to lose ground to this problematic weed.

WATER RIGHTS

Modoc NWR holds water rights on two creeks which drain from portions of the Warner Mountain watershed, east of the Refuge. The Refuge holds 52% of the total water rights within the Pine Creek irrigation district, the major water source for the Refuge. A significant water right is also held on Parker Creek. Diversions in the winter from these two creeks fill Dorris Reservoir, an 11,100 acre foot storage area. Stored water from the Reservoir are utilized in spring and summer to irrigate Refuge meadows and to maintain pond and marsh water levels.

Water rights for the Refuge and surrounding landowners are enforced through a Watermaster, employed by the State of California Department of Water Resources. The Refuge will pay $6,868 for this service from July 1, 1998 to June 30, 1999. The Refuge paid $7,000 for this service from July 1, 1999 to June 30, 2000.

Wildlife

WILDLIFE DIVERSITY

An abundance of wetland habitat, in combination with riparian areas, wet meadows and uplands on Modoc NWR support a high diversity of wildlife species in this high desert area. In total, more than 250 species of birds have been documented on the Refuge. The Refuge's habitat is also an important nesting area for more than 76 species of ducks, geese, greater sandhill cranes and several other species of marsh birds. In addition to bird species, the diverse habitats on the Refuge support a wide range of mammals, reptiles, amphibians, insects and plant life.

ENDANGERED AND / OR THREATENED SPECIES

The Refuge supports two federally endangered species, the bald eagle and peregrine falcon. Bald eagles can be found on the Refuge during winter as they follow the migration of waterfowl southward and then return north to their breeding grounds at the end of winter. Bald eagles utilize the Refuge for foraging of waterfowl. The number of bald eagles peaked during January of 1999 when 6 birds were observed. The eagles left at the close of winter. They returned for the winter of 1999-2000 with the first bald eagle

observed on the Refuge in November, 1999. The Refuge on occasion supports another federally endangered species, the peregrine falcon. It is proposed for the peregrine falcon to be downlisted from endangered to threatened by the Service next year. No peregrine falcons were observed on the Refuge in 1999.

There are several species which are on the State of California Endangered, Threatened or Species of Concern List. The Central Valley population of greater sandhill cranes and the willow flycatcher are both listed as threatened by the State. See below for details on these species, their use of the Refuge and the Refuge's management practices in relation to these species in calendar year 1999.

WATERFOWL

Ducks

Nesting ducks during the spring and summer of 1999 faired well on the Refuge. Mallards with broods were noted as early as XXX with most fledged by XXX. Broods of later nesting species, such as gadwalls, were observed as of XXX with most fledged by XXX. The estimated duck production for specific species on Modoc NWR for the past five years is detailed in Table X.

Table X: Estimated Duck Production at Modoc NWR from 1995 to 1999

		# of Pairs	+ 10 % not Observed	x .25 Habitat not Covered	Nest Success	Average Brood Size	Total Production
1995	Mallard	818	900	1199	.286	4.50	1543
	Gadwall	377	414	553	.286	4.70	743
	Cinnamon Teal	94	103	138	.286	4.30	170
	Pintail	18	20	26	.286	4.30	32
	Wigeon	22	24	32	.286	4.70	43
	Shoveler	75	82	110	.286	5.60	176
	Redhead	65	71	95	.286	4.40	119
	Ruddy Duck	40	44	58	.286	4.00	66
	Scaup	52	57	76	.286	5.20	113
1996	Mallard	506	--	742	.551	5.55	2269
	Gadwall	499	--	731	.546	5.85	2335
	Pintail	0	--	0	0	0	0
	Cinnamon Teal	71	--	104	.546	7.14	405
	Wigeon	20	--	29	.546	4.44	70
	Shoveler	60	--	88	.546	5.50	264
	Redhead	30	--	44	.68	4.99	149
	Scaup	43	--	63	.43	6.13	166
1997	Mallard	546	--	827	.191	4.03	636
	Gadwall	371	--	544	.186	4.81	487
	Pintail	0	--	0	0	0	0
	Cinnamon Teal	118	--	173	.186	4.50	145
	Wigeon	0	--	0	0	0	0
	Shoveler	103	--	151	.186	2.57	77
	Redhead	48	--	70	.68	6.00	286

	Scaup	38	--	56	.43	6.00	144
1998	No data was available for this year as the breeding pair count survey was not conducted due to staff turnover.						
1999	Mallard						
	Gadwall						
	Pintail						
	Cinnamon Teal						
	Wigeon						
	Shoveler						
	Redhead						
	Scaup						

XXX describe any duck trends, significant events, etc. on the refuge in 1999 XXX

Noted sightings this year included XXX.

Geese

XXX describe any duck trends, significant events, etc. on the refuge in 1999 XXX

Unfortunately due to staff turnover, a pair survey was not completed during 1999; therefore, nesting and brood surveys could not be completed as well. The following table describes the Canada goose production on Modoc NWR for the previous three years.

Table X: Canada Goose Production at Modoc NWR from 1996 to 2000

Year	# of Pairs	Nest Success Rate	Brood Size	Total Production
1996	744	66%	3.80	1,866
1997	570	80%	3.90	1,782
1998	606	54%	4.37	1,430
1999	no data	no data	no data	no data

Swans

The ponds and other wetland habitats on Modoc NWR provide a staging area for tundra swans during migration with the highest numbers of swans observed in late winter and early spring. The peak number of tundra swans on the Refuge in 1999 was XXX during XXX.

Coots

Another species which biologically falls under the rail family of birds, but is commonly grouped with waterfowl are American coots. The Refuge supports a large number of coot during the year 1999 with

numbers peaked at XXX during XXX.

MARSH AND WATER BIRDS

Approximately XX species of marsh and water birds used Modoc NWR during the year, including great blue herons, black-crowned night herons, great egrets, snowy egrets, greater sandhill cranes, American bitterns, pied-bill grebes, eared grebes, western grebes, Clark's grebes, white-faced ibis, American white pelicans, double-crested cormorants, Virginia rails and sora . Numbers this year peaked during July and August with approximately XXX birds present. Greater sandhill cranes, pied-billed grebes and XXX list all other seen nesting this year XXX were documented as nesting on the Refuge this year, but production data was determined only for the cranes.

Modoc NWR is the most important nesting area in Northeastern California for the Central Valley population of greater sandhill cranes; therefore, the Refuge places special emphasis on habitat management and data collection for this species, which is listed as threatened by the State of California. During this year, breeding pair counts and nesting pair surveys of cranes were conducted during the spring, in late April to early May. Crane production / nest success surveys were conducted near the end of August to early September. Table X summarizes the data collected for greater sandhill cranes at Modoc NWR from 1995 to 1999.

Table X: Sandhill Crane Production at Modoc NWR from 1995 to 1999

Year	Nesting Pairs	Nests Located	Successful Nests	Percent Successful	Colts Fledged	Percent Recruitment
1995	30	9	4	44%	9	15%
1996	34	11	6	60%	11	16%
1997	36	21	13	62%	15	17%
1998	44	29	14	48%	15	17%
1999	44	13	7	54%	14	16%

Crane banding operations were conducted from April through September. Only two juvenile cranes were captured by foot and banded in 1999. Refuge staff did not use rocket nets to attempt to capture and band adult cranes this year, a technique not used since 1992. The following table shows the number of cranes banded at Modoc NWR from 1995 to 1999.

Table X: Crane Banding Data at Modoc NWR from 1996 to 2000

Year	Number of Cranes Banded
1995	1
1996	0
1997	7
1998	11
1999	2

SHOREBIRDS, GULLS, TERNS AND ALLIED SPECIES

Sandpipers, Wilson's phalaropes, greater yellowlegs, willets, dunlins, long-billed dowitchers, long-billed curlews, black-necked stilts, killdeer, common snipe, American avocets, Forster's terns, Caspian terns, ring-billed gulls and California gulls were all documented at the Refuge this year as they stopped at the Refuge on their long journeys south. The Refuge provides shallow ponds and exposed mudflats which are favorite feeding areas for shorebirds and open water areas for gulls, terns and other species. The following species were documented as nesting on the Refuge, but no production data was formulated: long-billed curlews, killdeer, black-necked stilts and American avocets.

RAPTORS, OWLS AND ALLIED SPECIES

A total of XX species of raptors, owls and allied species (such as turkey vultures) were documented on the Refuge this year. Raptors who nested on the Refuge included American kestrels, great-horned owls, barn owls, short-eared owns, northern harriers and red-tailed hawks, although production data was not determined. Noted sightings in 1999 included a XXX.

OTHER MIGRATORY BIRDS

Small, but important, riparian areas on the Refuge provide nesting and forage areas for raptors, woodpeckers and neotropical migrants such as warblers, swallows, flycatchers and sparrows. Upland areas on the Refuge provide forage and nesting sites for California quail, ring-necked pheasants, waxwings, western meadowlarks, sage thrashers, American robins, bluebirds, finches and other songbird species. Noted sightings during the year included: XXX

A mist netting project at Modoc NWR initially began in 1982 as a ten year study to monitor the breeding population of yellow warblers and willow flycatchers. After 1992, Refuge staff continued the mist netting project and began formally submitting the data to the Monitoring Avian Productivity and Survival project (MAPS) on the various neotropical migrants captured. MAPS data is collected at various locations all over the United States by the Institute for Bird Populations in Point Reyes, California. The Refuge's MAPS station continued to be

conducted in 1999 at the riparian habitat on the Refuge's Sub-headquarters unit. Half the effort to collect this important data was on a volunteer basis by staff on weekends or by qualified volunteers. Table X describes the data collected for the Refuge's MAPS station for the past five years.

Table X: Monitoring Avian Population and Survival (MAPS) Station Data from 1995 to 1999

Year	Total Days of Operation	Total Net Hours	Birds per 100 Net Hours	Total Birds Captured	Total Number of Species
1995	23	904	107	1019	42
1996	20	878	59	514	39
1997	20	733	82	603	36
1998	9	no data	no data	265	no data
1999	9	no data	no data	305	no data

Noted species captured during the mist netting project included: XXX

GAME MAMMALS

With the beginning of 1999, the mule deer population continued to thrive on the Refuge With the onset of spring, numerous fawns were observed on the Refuge, although an official deer survey was not completed. During the dry summer, mule deer were scarce on the Refuge, as they headed to higher elevations for greener pastures. The mule deer returned to the Refuge in October as hunting season began, as well as when temperatures dropped and occasional snow showers began to blanket the ground.

Small herds of pronghorn were observed on the west side of the Refuge, usually by the Highway 395 Overlook from May through November of 1999.

OTHER RESIDENT WILDLIFE

Other mammals observed on the Refuge this year include: black-tailed hare, Nuttall's cottontail, pygmy rabbit, Belding's ground squirrel, Beechey's ground squirrel, beaver, various gophers, various mice, muskrat, porcupine, coyote, raccoon, mink, long-tailed weasel, badger, striped skunk, spotted skunk, river otter and bobcat. Other mammals are known to occur on the Refuge, but were not specifically observed this year, e.g., mountain lion.

FISHERY RESOURCES

The following fish species are known to occur within the various waters of Modoc NWR: Pit-Klamath

brook lamprey, brown trout, rainbow trout, Goose Lake redband trout, Sacramento sucker, bluegill, green sunfish, largemouth bass, brown bullhead, channel catfish, hardhead, Pit roach, Sacramento squawfish, speckled dace, Tui chub and Pit sculpin.

ANIMAL CONTROL

This year, the Refuge staff continued predator control through techniques such as trapping as a method to control predation of waterfowl and greater sandhill cranes. Predator control involved coyotes, mink and striped skunks. Additionally, muskrat and ground squirrel control was employed to prevent further damage and deterioration of water control structures on the Refuge.

MARKING AND BANDING

XXX describe any waterfowl banding on the Refuge XXX

As mentioned previously under the *Marsh and Water Birds* section of this report, greater sandhill crane banding operations were conducted from April through September with only two juvenile cranes captured by foot and banded in 1999.

DISEASE PREVENTION AND CONTROL

There were no large scale, disease outbreaks observed on the Refuge in the year 1999.

INJURED OR SICK WILDLIFE

The Refuge continued to receive injured or sick wildlife from the public in addition to those found by staff on the Refuge. During the spring, the "injured" wildlife received from the public was often baby birds such as sparrows and starlings. Refuge staff could not do anything for these birds, but an attempt was always made to educate the individual who brought in the baby bird. If possible, the injured or sick wildlife was transported to a rehabilitation facility in Klamath Falls, Oregon.

Public Use

GENERAL

Use of Modoc NWR by the public during the year 1999 included a variety of recreational and educational activities such as fishing at Dorris Reservoir, waterfowl hunting, special junior pheasant hunts, wildlife observation and environmental education. A total of 27,125 visitors were recorded to have visited the Refuge this year.

The Refuge issued 4 news releases to local and regional newspapers covering topics such as waterfowl hunting, special junior hunts and wildlife updates. The majority of newspapers were cooperative and supportive in helping the Refuge disseminate information on these issues.

OUTDOOR CLASSROOMS - STUDENTS

School groups from Modoc County continued to utilize the Refuge for various environmental education programs. A total of 408 students participated in an outdoor classroom setting to teach about wildlife ecology and wildlife management. The majority of students were taken on an interpretive tour of the Refuge where Refuge staff taught the students about wildlife and the Refuge, and entertained questions from the students. In addition to the tour, many teachers and their students utilized the educational classroom (a.k.a. cook's quarters) that is attached to the main residential quarters at the Refuge. This area provided an indoor classroom setting on the Refuge, allowing for environmental education to be presented in different formats, often times supplementing or in conjunction with an interpretive tour.

INTERPRETIVE FOOT TRAILS

The Wigeon Pond walking trail continued to be enjoyed by approximately 2,200 visitors in the year 1999. This trail provides an alternative to the Auto Tour Route for those visitors who wish to get a more personal look at wildlife on the Refuge.

INTERPRETIVE TOUR ROUTES

The three mile Auto Tour Route, mainly surrounding Teal Pond, continued to be a main source of recreational enjoyment for visitors at Modoc NWR. Visitors to the Auto Tour Route numbered approximately 16,000 in the year 1999. Highway 395 parallels the west side of the Refuge and County Road 115 bisects the Refuge. Both of these roads provided an "unofficial" tour route for visitors to enjoy wildlife viewing on or near the Refuge. The number of visitors along these routes were not ascertained.

As part of improvements made to the main entrance road, a small, visitor parking lot was paved at the end of the Auto Tour Route, just off the entrance road. It is planned for the direction of the Auto Tour Route to switch next year, which will enable the new parking lot and a planned information kiosk to be at the new start/entrance of the Auto Tour Route. Currently, the information kiosk resides at the old entrance of the Auto Tour Route, near the Refuge headquarters.

INTERPRETIVE EXHIBITS / DEMONSTRATIONS

As mentioned above, the Refuge's main interpretive kiosk will be moved from near the headquarters (the old entrance) to the new entrance of the Route next year. This kiosk continues to be a source of environmental education for visitors to the Refuge with emphasis on refuge management activities and goals, as well as management for greater sandhill cranes. An interpretive kiosk at the Highway 395

Overlook was completed this year, but interpretive panels from the Refuge will not be installed until next year. These interpretive panels will be created from drawings by artists Shari Erickson and Sandy Klein.

HUNTING

The terms of duration, bag limits and possession limits for the waterfowl hunting season of 1999-2000 are described in the following table:

Table X: Regulations for the 1999-2000 Waterfowl Hunting Season

Waterfowl	Season	Limits	Details or Notes
Ducks	10/9/1999 to 1/16/2000	7 daily, 14 in possession	Daily bag included the following: up to 7 mallards (but no more than 2 females), 1 pintail, 1 canvasback, 2 redheads, & 4 scaup
Geese	10/9/1999 to 1/16/2000 - all geese except white-fronted & cackling 10/9/1999 to 11/20/2000 - white-fronted & cackling geese only	Total (white & dark): 3 daily, 6 in possession	Species Limits: Dark Geese (Canada, white-fronted & cackling): 2 daily - of which only 1 may be a cackling goose White Geese (Snow & Ross): 3 daily, 6 in possession
Coot & Moorhen	10/9/1999 to 1/16/2000	25 daily, 50 in possession	- -
Snipe	10/9/1999 to 1/16/2000	8 daily, 16 in possession	- -

January 16th marked the end of the 1999-2000 waterfowl hunting season on the Refuge. Despite the above average kills for the decade, the 1999-2000 season was dictated by unusually warm weather that prevented the birds from moving down from northern staging areas. The ponds on the Refuge froze over sending most of the ducks southward but warmer temperatures to the North kept the birds from migrating south until shortly after Christmas when hunting for both ducks and geese markedly improved. The total number of hunters was down slightly from previous years probably due to reports of low bird numbers on the Refuge. But most of the hunters that did not make it were from out of town, as there was a proportionately high number of local hunters this year.

A total of 1,645 hunters took 2,822 birds during the season. The average of 1.71 birds per hunter was slightly up from the past five years, which averaged between 1.4 and 1.6 birds per hunter. During the 1999-2000 season, the harvest statistics for the following birds were specifically tracked with the number

taken in parenthesis: gadwall (327), green-winged teal (95), mallard (1,256), pintail (138), wigeon (490), Canada geese (169), snow geese (8) and white-fronted geese (10). Other species harvested included northern shovelers, redheads, cinnamon teal, ring-necks canvasbacks, lesser scaups, goldeneyes, buffleheads and coots. The following table summarizes the waterfowl harvest at Modoc NWR during the last two hunting seasons:

Table X: Summary of Harvest Statistics for the 1999-2000 Waterfowl Hunting Season at Modoc NWR

Year	# of Hunters	# of Waterfowl Harvested per Hunter	# of Ducks Harvested per Hunter	# of Geese Harvested per Hunter
1999	1,645	1.71	1.40	0.17

Two days of pheasant hunting for Juniors were also held on the Refuge in November with limited success. The community, parents and other hunters showed nothing but support for these two special hunt days and the Refuge hopes to continue holding pheasant hunts for Juniors in the future.

FISHING

Dorris Reservoir is the only body of water where fishing is allowed on the Refuge. The Reservoir is a popular area for fishing, especially for local anglers. Largemouth bass, channel catfish, sunfish, and rainbow trout can be found in the Reservoir. Fishing is permitted during daylight hours except during waterfowl hunting season (usually October through January). All California State fishing regulations apply to fishing at the Reservoir.

There were approximately 1,875 anglers recorded to have used Dorris Reservoir during 1999.

WILDLIFE OBSERVATION

It was estimated that approximately 20,200 visitors utilized Modoc NWR for wildlife observation in 1999. Wildlife observation at the Refuge focuses on waterfowl and other marsh birds as observed from the Auto Tour Route around Teal Pond. Visitors from the local area also enjoy the mule deer and raptors that frequent the Refuge. A large number of out-of-town visitors continue to find this small, isolated Refuge to not only observe water birds and (especially nesting greater sandhill cranes), but to also enjoy raptors and songbirds. This latter phenomenon is consistent with what is occurring all across the country, as birders

seek new and interesting locations to see a variety of birds. The Refuge still does not receive the amount of visitors that other National Wildlife Refuges see each year, but Refuge staff continues to hear that the Refuge is a nice stop as visitors make their way to or from Reno, Redding, Bend or other National Wildlife Refuges in the area. As one visitor commented, "the Refuge is a great diversion on the way to Malhuer National Wildlife Refuge." Modoc NWR staff welcomes any reason for the public to stop and enjoy the fruits of our work.

OTHER WILDLIFE ORIENTED RECREATION

Wildlife photography continued to be a popular means of recreation at Modoc NWR in the year 1999. Due to the scenic beauty of the area with the Warner Mountains as a backdrop, as well as the variety of wildlife that frequents the Refuge's wetland habitats, many photographers stopped at the Refuge capture waterfowl, greater sandhill cranes and mule deer on film. The exact number of photographers who used the Refuge in 1999 was not known.

OTHER NON-WILDLIFE ORIENTED RECREATION

Waterskiing is a permitted use at Dorris Reservoir, although Refuge staff nor landowners around Dorris Reservoir noticed few if any skiers utilizing the Reservoir during the open season of June 1 through September 30, 1999. This inactivity was probably due to opportunities for better waterskiing at other areas in the region.

LAW ENFORCEMENT

During 1999, law enforcement was provided by the Assistant Refuge Manager until his death in August. After that time, the Refuge did not have an employee with law enforcement credentials to continue the program.

Equipment and Facilities

REHABILITATION

Annual rehabilitation by Refuge staff occurred in 1999, mostly involving the repair and maintenance of dikes, levees and water control structures that had received routine damage from the weather and wildlife (specifically muskrats, beavers and ground squirrels). Specific rehabilitation or improvement projects that were performed by Refuge staff in 1999 include the following:

- performed a prescribed burn on Goose Pond and then rebuilt the nesting / resting islands
- performed a prescribed burn on Railroad Pond and then rebuilt the nesting / resting islands
- rebuilt the nesting / resting islands in Little Goose Pond
- rebuilt the nesting / resting islands in Sloss Pond

- rebuilt the nesting / resting islands in the North and South Grain fields

MAJOR MAINTENANCE

Modoc NWR received funding for nine MMS projects in 1999, which was many more than is received in most years, including: the purchase and installation of a hazardous materials storage building; safety improvements and repairs to the Sharkey Dam bridge; major improvements to the Hamilton trailer quarters; major improvements / repairs to quarters #14, the main residential quarters on the Refuge; repair of the Grandma field irrigation canal, as well as installation of a boundary fence; rehabilitation to the Dorris Canal; replacement of an S-10 pickup used by the maintenance staff; replacement and upgrades to computers systems for the year 2000 compliance; and the purchase of a new copier / fax machine.

The hazardous materials storage building was purchased and installed by Haz-Stor Inc. for $28,150 next to the maintenance shop, just inside the fenced storage yard. Before and after arrival of the building, two local contractors were hired to pour a concrete pad for $2,650 (John Albertson) and supply electricity to the building for $1,500 (B&D Electric). The haz mat building is a state of the art storage building to mainly store chemicals used by the Refuge staff.

The Sharkey Dam bridge received approximately $9,000 in repairs performed by Steve Barrow's Inc. including epoxy injections into the concrete and new safety guard rails. The repairs were nearly 85% complete by the contractor before weather prohibited continuation. The repairs will be completed by the summer of next year.

The Hamilton trailer quarters also received major improvements and repairs including: replacement of the existing well and delivery pipes by Heard Plumbing for approximately $7,500; replacement and repair of existing plumbing by Heard Plumbing for approximately $5,000; and replacement of the trailer's skirting by Steve Barrow's Inc. for approximately $3,100. Quarters # 14 received the following repairs and improvements: approximately $6,800 for Bethel's Propane to improve the heating system; approximately $15,000 for Heard Plumbing to replace and repair existing plumbing; approximately $4,000 for Heard Plumbing to replace the existing well; approximately $10,000 for Steve Barrows, Inc. to replace the existing windows and southeast facade.

The irrigation canal in the Grandma field was repaired by Refuge staff. Additionally, the staff installed approximately $6,700 worth of new fence along the boundaries of the Grandma field that did not have fencing when the property became part of the Refuge. Additionally, the Refuge staff rehabilitated Dorris Canal to shore up erosion and rodent damage with approximately $15,250 worth of rip rap and gravel.

Paperwork and obligation of funds were processed to replace the S-10 pickup used by maintenance employee, Greg Albertson. Delivery of the new Chevrolet truck is expected by the middle of next year at the latest. To upgrade or replace computer systems and software in anticipation of the year 2000, the Refuge received MMS funds to purchase a new HP Laser Jet printer, a new computer for the Assistant Refuge Manager and a new computer for the Refuge Manager. Additionally, MMS funds were used to purchase a new Canon copier / fax machine for approximately $7,600.

As mentioned previously in the *Administration* section of this report, the Refuge received $115,000 in

Federal Highway Administration TEA-21 funds in fiscal year 1999 to complete improvements to the main entrance road and public use road to the Refuge. After permits and clearances were received, Fitch Sand and Gravel was issued a contract to re-contour and place asphalt paving along the 1.25 mile entrance road. As part of these improvements, a small, visitor parking lot was paved at the end of the Auto Tour Route, just off the entrance road. It is planned for the direction of the Auto Tour Route to switch next year, which will enable the new parking lot and a planned information kiosk to be at the new start/entrance of the Auto Tour Route. Currently, the information kiosk resides at the old entrance of the Auto Tour Route, near the Refuge headquarters.

EQUIPMENT UTILIZATION AND REPLACEMENT

The Refuge received one replacement vehicle during calendar year 1999. Routine maintenance was performed by Refuge staff on all vehiclesand heavy equipment during 1999 such as oil and filter changes. Minor repairs to vehicles such as tire replacement and recall notices were performed by private companies.

The following major equipment repairs or replacements were made during the year 1999:

- As mentioned in the *Safety* section of this repair, due to an accident, the Jeep Cherokee was repaired by Pioneer Auto Body;
- A new Canon copier / fax machine was purchased;

COMMUNICATIONS SYSTEMS

The radio system at Modoc NWR did not receive any repairs or maintenance in 1999. National funding will be provided to replace the radio system at the Refuge in the year 2002, although the current radio system receives limited use by Refuge staff.

The majority of Refuge staff utilized cellular phones on a regular basis as an alternative to the radio system. The main advantages to this service over the radio system are: a larger range of service in which the phones will work versus a limited area for the radio system; more of a private conversation with a cellular phone versus the radio system; and the convenience of having staff almost always answering their phones versus hoping they're near a radio to hear a call.

For office phone service, the Refuge continues its use of a Lucent Technologies phone system which was installed at the end of 1998. No major repairs or maintenance was made to this system in 1999.

COMPUTER SYSTEMS

Advanced planning by the Service allowed for funds to be secured in 1999 for the upgrade and replacement of computers systems and software for the year 2000. As mentioned above, MMS funds were obtained to upgrade for the year 2000 compliance and included the purchase of a new computer for the Assistant Refuge Manager, a new computer for the Refuge Manager and a new HP Laser Jet printer.

Other Items

Credit

Many Refuge Managers believe that given today's instant communication and the lack of dedicated, undisturbed time to capture information, annual narratives are becoming obsolete. Given the amount of turnover at some National Wildlife Refuges, including Modoc NWR, the staff at Modoc NWR found it extremely helpful to be able to go back to gleam information from annual narratives. Thus Modoc NWR staff found it necessary to continue writing annual narratives for future Modoc NWR employees to peruse.

Some general information with regard to the Refuge was drawn from the Refuge's last annual narrative which was written in 1992 by E. Clark Bloom, David Johnson, Ronnie Ryno and Kevin DesRoberts. To compile specific information for the calendar year 1999, various Refuge documents and reports were used, in addition to the contributions of the entire staff at which time this was written: Greg Albertson, Carl Cox, Anne Marie LaRosa, Amy LaVoie and Patty Walcott. The majority of writing and editing of the narrative was completed by Anne Marie LaRosa, Amy LaVoie and Patty Walcott.

This narrative is dedicated to the memory of Ronnie L. Ryno.